

# CMMA Monthly Seminar

## 第31回 CMMA 月例セミナー

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Contagious phenomena of price fluctuations of financial markets have often been observed worldwide since the global economic crisis driven by the bankruptcy of Lehman Brothers in 2008. In order to cope with difficulties in controlling spillovers and policy planning, it is necessary to clarify the mechanisms behind contagious phenomena. In particular, since the prices of financial assets fluctuate with both serial correlations and time series correlations, identifying the dynamic structure, i.e., measuring the degree and direction of influence between markets, is significant. In a multivariate system, the presence of feedback can be expressed by the time domain approach. On the other hand, although periodic variations of repetitive and regular movements of time series can be expressed by the frequency domain approach, there are practical difficulties in capturing feedback loops. As a causation measure in a multivariate feedback system, we introduce a generalized power contribution (Tanokura and Kitagawa 2004, 2015), i.e., a generalized version of Akaike's power contribution (Akaike 1968). It reveals frequency-wise causations of multi-dimensional noise sources on the power of the fluctuation of each variable. In other word, it measures the degree of simultaneous influence between various combinations of the noises of variables, so multi-directional causations between variables can be evaluated. As an application, we investigate the long-term fluctuation structures of the return series of the TOPIX (Japan), the S&P 500 (USA) and the DAX (Germany), focusing on the mutual relationship of fluctuation between their return trend components, which are extracted by applying a seasonal adjustment model (Gersch and Kitagawa 1983, Kitagawa and Gersch 1984). In this talk, the characteristics of these fluctuations will be shown and future works will also be discussed.

Detecting information flows by  
applying a statistical causation measure to  
stock market returns

日時：2019年3月22日(金) 16:30-17:30

場所：明治大学 中野キャンパス高層棟6階 研究セミナー室3

主催：

文部科学省 共同利用・共同研究拠点  
明治大学先端数理科学インスティテュート  
現象数理学研究拠点 (CMMA)



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